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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/508,136	06/05/2000	FOROOZAN GHASSEMI	595-001	8908
29673	7590	10/17/2003	EXAMINER	
STEVENS & SHOWALTER LLP 7019 CORPORATE WAY DAYTON, OH 45459-4238			DEB, ANJAN K	
			ART UNIT	PAPER NUMBER
			2858	

DATE MAILED: 10/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

EC

<b>Office Action Summary</b>	Application No. 09/508,136	Applicant(s) GHASSEMI, FOROOZAN	
	Examiner Anjan K Deb	Art Unit 2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 October 2000.
- 2a) ☐ This action is **FINAL**.
- 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 62-128 is/are pending in the application.
- 4a) Of the above claim(s) 89-103 and 122 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 62-88, 104-121 and 123-128 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 62-128 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☒ Interview Summary (PTO-413) Paper No(s). 13
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

### **DETAILED ACTION**

1. This office action is in response to preliminary amendment filed on 10-30-00 and telephone conversation with attorney on 9-11-03.

### ***Election/Restrictions***

2. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions, which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 62-88, 104-121, 123-128 drawn to measuring an electrical power parameter by RMS averaging.

Group II, claim(s) 89-103, 122, drawn to measuring an electrical power parameter by carrying out frequency spectra analysis.

The above inventions lack unity of invention under PCT Rule 13.1, because under PCT Rule 13.2, the inventions lack the same or corresponding special technical features for the following reasons:

Group I invention lacks the special technical feature of carrying out frequency spectra analysis of Group II invention.

Group II invention lacks the special technical feature of RMS averaging of Group I invention.

During a telephone conversation with Mr. Richard C. Stevens on 9-11-03, a provisional election was made with traverse to prosecute the invention of Group I, claims 62-88, 104-121, 123-128. Affirmation of this election must be made by applicant in replying to this Office action.

***Claims Withdrawn from Consideration***

3. Claims 89-103,122 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

***Specification***

4. The disclosure is objected to because of the following informalities:
  - Does not conform to preferred layout (see guidelines below)
  - Format pages 29-52 according to preferred layout (see guidelines below)

Appropriate correction is required.

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The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

### *Arrangement of the Specification*

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or  
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (e) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (f) BRIEF SUMMARY OF THE INVENTION.
- (g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (h) DETAILED DESCRIPTION OF THE INVENTION.
- (i) CLAIM OR CLAIMS (commencing on a separate sheet).
- (j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (k) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

***Information Disclosure Statement***

5. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 62, 121,123 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 62, 121,123 the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 62-66, 68-69, 87 are rejected under 35 U.S.C. 102(b) as being anticipated by  
Arseneau (US 4,937,520).

Re claim 62, Arseneau discloses (Fig. 1) method of measuring an electrical power parameter comprising measuring instantaneous voltage  $V_{in}$  and current  $I_{in}$ , carrying out relative phase shift 8 between the instantaneous voltage  $V_{in}$  and instantaneous current  $I_{in}$ , calculating a first instantaneous power  $P_7$  as the product of instantaneous voltage  $V_{in1}$  and instantaneous current  $I_{in2}$ , calculating a second instantaneous power  $Q_{11}$  as the product of instantaneous relatively phase shifted product of instantaneous voltage  $V_{in1}$  and instantaneous current  $I_{in2}$ , RMS averaging (short term average: see column 1 lines 17-35) 15 first  $P$  and second  $Q$  power component to determine the value of electrical power parameter  $S''$  (Apparent Power).

Re claim 63, Arseneau discloses carrying out relative phase shift 8 prior to calculating second instantaneous power  $Q$ .

Re claim 64, Arseneau discloses carrying out 90 degrees relative phase shift 8.

Re claim 65, Arseneau discloses determining Apparent Power  $S''$  by calculating 15 the square root of the sum of squares of the RMS values of instantaneous power P, Q.

Re claim 66, Arseneau discloses measuring mean value (short term average: see column 1 lines 17-35).

Re claim 68, Arseneau discloses integrating active power over a period of time as required to determine Energy Consumption (Wh)(column 2 lines 1-2).

Re claim 69, Arseneau discloses determining mean value of second power component Q (short term average)(column 1 lines 17-35).

Re claim 87, Arseneau discloses converting instantaneous current signal  $I_{in}$  of the electrical power signal into proportional voltage representation signal (transducer 2 output) for use in calculating and averaging steps (Fig. 1).

### ***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person



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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 67, 79-81, 120-121 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arseneau (US 4,937,520).

Re claim 67, Arseneau discloses all of the claimed limitations as set forth above including measuring mean value (short term average: see column 1 lines 17-35) of first instantaneous power component P without expressly disclosing calculating ratio of measured Active power P to measured Apparent Power S''.

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Arseneau by adding calculating ratio of Active power P to measured Apparent Power  $V_{in} I_{in}$  for determining power factor (Cos  $\phi$ ) from the relation  $P = VI \text{ Cos } \phi$ .

Re claim 79, Arseneau did not expressly disclose summing instantaneous powers of a multi-phase signal but clearly states applicability in multiphase phase system so as to minimize errors in conventional three phase power meters (column 2 lines 40-48).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Arseneau by adding summing single phase instantaneous power components for measuring power in three phase power distribution system.

Re claims 80-81, Arseneau did not expressly disclose a balanced or unbalanced multi-phase signal.

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Arseneau by adding summing single phase instantaneous power components from balanced or unbalanced three phase loads (load types: see column 2 lines 15-26) in distribution system for measuring power in three phase power distribution system.

Re claim 120, Arseneau discloses determining harmonic content of non-sinusoidal waveform signal (distorted waveform)(column 2 lines 40-44).

Re claim 121, Arseneau discloses determining apparent power  $S''$  (Fig. 1)(also see Title).

12. Claims 70-72, 88, 104-107, 110, 112, 119 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arseneau (US 4,937,520) in view of Hoffman et al. (US 5,673,196).

Re claims 70-71, 88, 104-105, 110, 112 Arseneau discloses method of measuring an electrical power parameter (Apparent Power), of an electrical power signal, comprising calculating first P and second Q instantaneous power components as the respective products of non phase shifted/phase-shifted, instantaneous voltage and instantaneous current signals and RMS averaging (short term average)(column 1 lines 17-35) each of the first and second instantaneous power components to determine their respective magnitudes, and using the calculated magnitudes to determine the value of the electrical power parameter (Apparent Power)(Fig. 1).

Arseneau did not expressly disclose filtering instantaneous voltage and instantaneous current signals for determining harmonic power parameter including delivered power frequency spectrum.

Hoffman et al. discloses filtering instantaneous voltage and instantaneous current signals for obtaining a power parameter at a band of frequencies including fundamental frequency voltage and current signals for obtaining harmonic power parameter ( $U = P+Q+D$ ) in a band of frequencies.

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Arseneau by adding filtering disclosed by Hoffman et al. to produce fundamental frequency voltage and current signals for obtaining power parameter in a band of frequencies including harmonic power parameter.

Re claims 72, 106, Arseneau did not expressly disclose filtering step results in at least one of the harmonic frequency components of at least one of the instantaneous voltage or instantaneous current signals being obtained.

Hoffman et al. discloses filtering step results in at least one of the harmonic frequency components of at least one of the instantaneous voltage or instantaneous current signals being obtained (column 13 lines 28-61).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Arseneau by adding filtering disclosed by Hoffman et al. for obtaining instantaneous value of voltage or current signals.

Re claims 107, Arseneau did not expressly disclose Delivered Power Parameter frequency spectrum.

Hoffman et al. discloses Delivered Power Parameter frequency spectrum (see band of frequencies disclosed in column 13 lines 28-61).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Arseneau by adding filtering disclosed by Hoffman et al. for obtaining power parameter in a band of frequencies.

Re claims 119, Arseneau did not expressly disclose sampling instantaneous voltage and instantaneous current signals to obtain a digital representation of the voltage and current signals for use in subsequent processing steps.

Hoffman et al. discloses vector electricity meter and associated vector electricity metering methods comprising sampling instantaneous voltage 110 and current signals 120 and converting to digital representations 320 for processing 330 (Fig. 1).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Arseneau by adding sampling instantaneous voltage and current signals and converting to digital representations for processing by a computer disclosed by Hoffman et al. for calculating a power parameter.

13. Claims 82-86, 113-118, 123-126 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arseneau (US 4,937,520) in view of Schulz (US 3,697,872).

Re claims 82-86, 113-118, 123-126 Arseneau discloses all of the claimed limitations as set forth above without expressly disclosing resolving multi-phase signal into a phase sequence.

Schulz teaches measuring the power consumption of unbalanced three phase loads by resolving multi-phase signal into three balanced components (phase sequence) comprising in phase component  $U_m$  (+ve sequence), out of phase component  $U_g$  (-ve sequence), and a zero component  $U_o$  (column 2 lines 33-39).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Arseneau by adding resolving unbalanced multi-phase signal into balanced three phase sequence disclosed by Schulz for measuring power in unbalanced multi-phase power distribution system.

14. Claims 73-78, 108-109, 111 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arseneau (US 4,937,520), and Hoffman et al. (US 5,673,196) in view of Shilo (US 5,072,187).

Re claims 73-78, 108-109, 111, Arseneau as modified by Hoffman et al. lacks determining Current Distortion Power Parameter and Voltage Distortion Power Parameter. While Hoffman et al. discloses filtering and determining a distortion power parameter D they

do not expressly disclose determining voltage and current distortion power parameters separately.

Shilo teaches determining both Current Distortion Power Parameter ( $THD_i$ ) and Voltage Distortion Power Parameter ( $THD_v$ )(column 4 lines 22-68, column 5 lines 1-17).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Arseneau and Hoffman et al. by adding determining both Current Distortion Power Parameter ( $THD_i$ ) and Voltage Distortion Power Parameter ( $THD_v$ ) disclosed by Shilo for determining accurately the total harmonic distortion and/or power factor of a non-linear circuit as a function of both current and voltage waveform distortions.

15. Claims 127-128 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arseneau (US 4,937,520), and Schulz (US 3,697,872), and further in view of Hoffman et al. (US 5,673,196).

Re claim 127, Arseneau as modified by Schulz discloses all of the claimed limitations as set forth above without expressly disclosing means for selectively displaying information regarding the values of the calculated power parameters.

Hoffman et al. discloses displaying plurality of power parameter in display 160 (Figs. 1-2).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Arseneau and Schulz by adding a display disclosed by Hoffman et al. for selectively displaying plurality of power parameters.

Re claim 128, Arseneau as modified by Schulz did not expressly disclose sampling instantaneous voltage and instantaneous current signals to obtain digital representation of the measured signals for subsequent processing steps.

Hoffman et al. discloses vector electricity meter and associated vector electricity metering methods comprising sampling instantaneous voltage 110 and current signals 120 and converting to digital representations 320 for processing 330 (Fig. 1).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Arseneau and Schulz by adding sampling instantaneous voltage and current signals and converting to digital representations for processing by a computer disclosed by Hoffman et al. for calculating a power parameter.

#### ***Pertinent Art***

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

McEachern (US 5,212,441) discloses harmonic-adjusted power meter comprising filtering instantaneous voltage 1 and instantaneous current 2 signals prior to calculation steps to filter out undesired frequencies (column 2 lines 20-28).

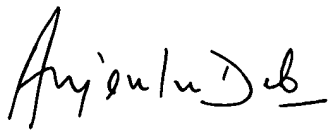
Komatsu (US 5,508,617) discloses measuring current and voltage signal wave distortions over a range of frequencies for calculating power parameter.

Rapp (US 5,144,226) discloses a method of measuring a power parameter by RMS averaging 28 and display 22 (Fig. 1)

***Contact Information***

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Anjan K. Deb whose telephone number is (703) 305-5219. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le, can be reached at (703)-308-0750.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone numbers are (703)-308-0956 and (703)-305-4900.



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